Abstracts

GaAs Dual-Gate FET for Operation up to K-Band

B. Kim, H.Q. Tserng and P. Saunier. "GaAs Dual-Gate FET for Operation up to K-Band." 1984 Transactions on Microwave Theory and Techniques 32.3 (Mar. 1984 [T-MTT] (Special Issue on Power and Low-Noise GaAs FET Circuits and Applications)): 256-261.

A high-frequency equivalent circuit model of a GaAs dual-gate FET and analytical expressions for the input/output impedances, transconductance, unilateral gain, and stability factor are presented in this paper. It is found that the gain of a dual-gate FET is higher than that of a single-gate FET at low frequency, but it decreases faster as frequency increases because of the capacitive shunting effect of the second gate. A dual-gate power FET suitable for variable gain amplifier applications up to K-band has been developed. At 10 GHz, a I.2-mm gatewidth device has achieved an output power of 1.1 W with 10.5-dB gain and 31-percent power-added efficiency. At 20 GHz, the same device delivered an output power of 340 mW with 5.3-dB gain. At K-band, a dynamic gain control range of up to 45 dB was obtained with an insertion phase change of no more than ±2 degrees for the first 10 dB of gain control.

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